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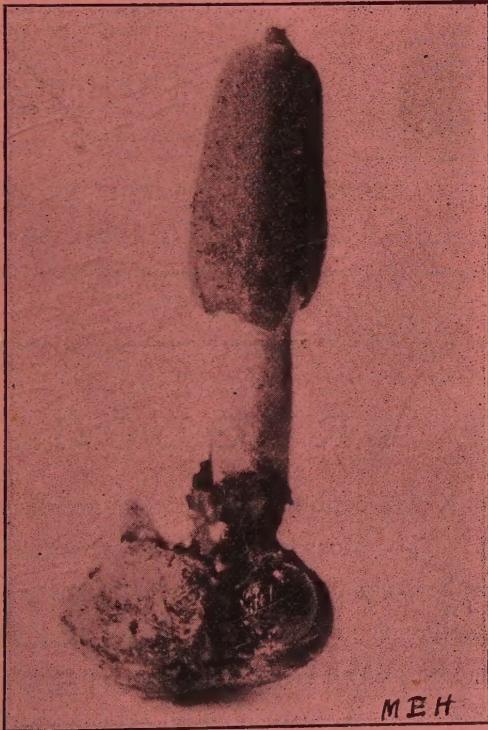
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MYCOLOGICAL BULLETIN

W. A. KELLERMAN, Ph. D.

OHIO STATE UNIVERSITY



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Mycological Bulletin

Nos. 61-62

W. A. Kellerman, Ph. D., Ohio State University

Columbus, July, 1906

EDITOR'S NOTES.

SETTLED.—The prolonged consideration of the postal status of the BULLETIN is happily terminated as the second-class entry note on the cover indicates. We had always considered our matter *second class* but the authorities were disposed to rate it higher! But the red tape has all been unwound and we can mail the BULLETIN hereafter without embarrassment.

FIGURES AND TEXT.—Some variation in matter as well as illustrations will be seen—for example we have drawn on Professor Atkinson's excellent book for a note on the uses of Mushrooms; then the peculiar growths on the common Hackberry tree are illustrated—where a fungus (though not called a Mushroom) is concerned as one of the causes.

THE FUNGUS OF THE HACKBERRY BRANCH-KNOT.—The Witches' Brooms, as they may be called, which are so common on the Hackberry tree, illustrated in Figs. 193 and 194, are caused by a mite (of the genus *Phy-top-tus*) and a Leaf-Mildew fungus associated. The distortion consists of multiplied branchlets due to the irritation of the two organisms. The explanation under the cuts (especially under Fig. 192) is perhaps all that is needed at present.

AN INTERESTING CORDYCEPS.

M. E. Hard.

CORDYCEPS is from a Greek word meaning a club and a Latin word meaning a head. This is a genus of Pyrenomyctetous fungi of which a few grow upon other fungi and grasses but by far the greater number are parasitic upon insects or their larva. The larva stage suffers most frequently from the parasitic fungi.

There are two species of Cordyceps found in the woods or wooded places of great interest to the mycologist. They are parasitic on Elaphomyces which are truffle-like growths found in soils. They are Cordyceps ophioglossoides, Adder's Tongue Cordyceps and Cordyceps capitata. The potato-like growth upon which they are found and the form of the fruiting body as indicated by their specific names, will clearly identify them.

Plant lice and flies suffer from attacks of fungi. The common house fly will frequently be seen hanging to the window pane surrounded by a visible halo of fungus spores which have been thrown from the fungus sacs and caught on the glass. A great portion of which were thrown into the

air where they float about until they come into contact with other flies. When a spore comes in contact with a healthy fly a fungus thread is produced which soon makes its way to the inside and continues to branch and grow till it kills the fly when it comes to the surface and forms a new crop of spores.

One of the most interesting group of parasitic fungi are the beetle fungi. They are extremely small and can only be seen by a strong lens. They are found on the legs of the water beetles and usually found on a certain joint of one leg. This localization is accounted for on the ground that plant sexes are often formed on different plants so sexual cells of fungi may be brought in contact by the breeding acts of the insects.



Fig. 190. COR'DY-CEPS HER-CU'LE-A. GIANT CATERPILLAR FUNGUS. See text for explanation. M. E. Hard, Chillicothe, Ohio.

The caterpillar fungus is the most common and presents many interesting features because of its ability to produce a variety of spores, each specialized for a definite purpose. Spores may be produced upon fruiting bodies similar to figure 190. As soon as a spore falls upon a caterpillar it germinates, sending out germ-threads in the body cavity. Here these germ-threads form new spores which move freely in the fluid of the caterpillar. These spores germinate until the entire body cavity and muscle fiber are thoroughly permeated by mycelium threads. These threads continue to branch and grow until they have absorbed all the larva's soft parts, retaining not only the external form of the caterpillar but also the internal form of

its organs. It is a complete fac-simile of the larva made up of fungus growth. This may be called a resting or storage organ. This requires time to ripen. It may send up an orange-colored club-shaped body as in figure 190 or it may produce a dense growth of threads resembling a small ball of cotton and from these threads another kind of spores is produced. This new kind of spore affects the larva in the same way as the kind already described. The caterpillar will continue to move sluggishly for some distance after it has been thus infected. The caterpillar fungus is of great economic value for thousands of larvae are killed in this way every year.

One of the largest forms of the caterpillar fungi is *COR'-DY-CEPS HERCULEA* Schw. An excellent representation is given in the half tone, figure 190. It is called *herculea* because of its large size. The species can be readily identified from this cut. It grows from the body of a large white grub found on rotten wood. A perfect form of the grub is retained yet every bit of the larva has been converted into fungus starch for storage material.

The plant is quite large, clavate in form, head oblong, round, slightly tapering upward with a decided protuberance at the apex as will be seen in the half tone. The head is a light yellow in all specimens I found, not glutaceous as Schweinitz states, nor is the head obtuse. They are found in August and September.

USE OF MUSHROOMS.

Geo. F. Atkinson, Cornell University.

Another very favorable indication accompanying the increasing interest in the study of these plants, is the recognition of their importance as objects for nature study. There are many useful as well as interesting lessons taught by mushrooms to those who stop to read their stories. The long growth period of the spawn in the ground, or in the tree trunk, where it may sometimes be imprisoned for years, sometimes a century, or more, before the mushroom appears, is calculated to dispel the popular notion that the mushroom "grows in the night." Then from the button stage to the ripe fruit, several days, a week, a month, or a year may be needed, according to the kind, while some fruiting forms are known to live from several to eighty or more years. The adjustment of the fruit cap to a position most suitable for the scattering of the spores, the different ways in which the fruit cap opens and expands, the different forms of the fruit surface, their colors and other peculiarities, suggest topics for instructive study and observation. The inclination, just now becoming apparent, to extend nature study topics to include mushrooms is an evidence of a broader and more sympathetic attitude toward nature.

A little extension of one's observation on the habits of these plants in

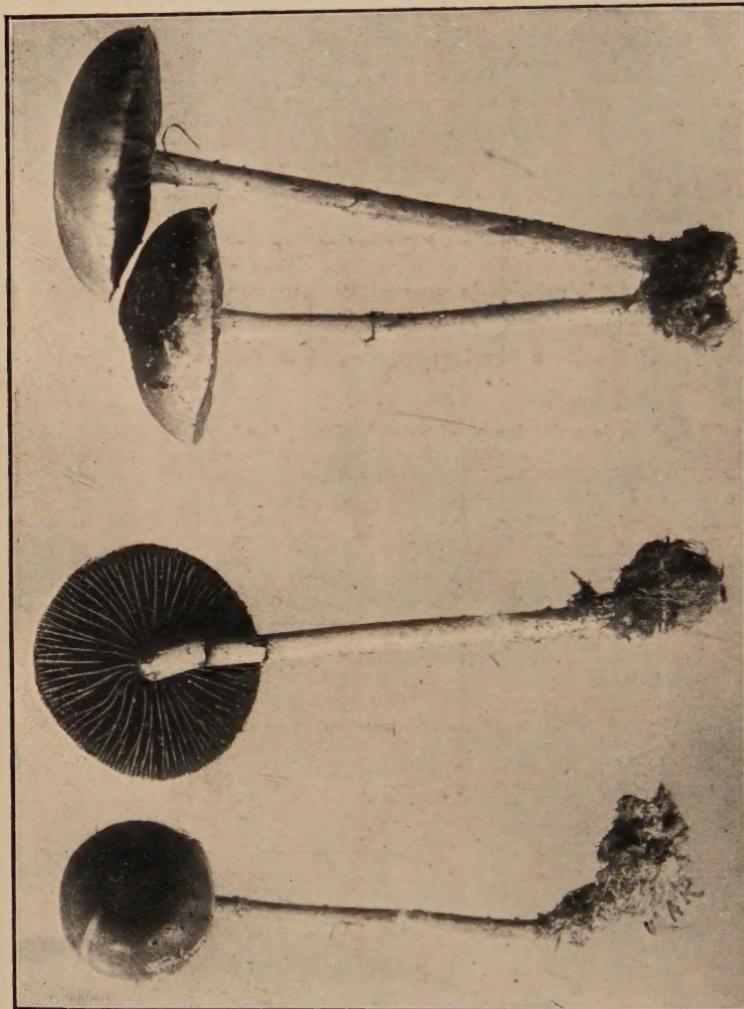


Fig. 191. *PA-NAE'-O-LUS CAM-PAN-U-LA'-TUS*.—See explanation at bottom of the page.

PA-NAE'-O-LUS.—This a genus of black-spored Agarics, somewhat resembling the species of *Coprinus*, but the gills not deliquescent or dissolving into ink as in case of the latter genus. The pileus is somewhat fleshy or thin and the margin even (not striate). The genus is further characterized as having gills not uniform in color, being clouded or spotted with black or brown colors, the edges of the gills often white in contrast. The stem is usually smooth.

The species shown on this page was collected near Columbus, Ohio; it grew from old horse dung in a pasture, the plants being few and scattered. McIlvaine says he has "several times eaten of this fungus in small quantities, because larger could not be obtained, and with no other than pleasant effect." But he advises caution because a case of poisoning from eating this species was reported in 1816 in the London Medical and Surgical Journal.

the woods will reveal the fact that certain ones are serious enemies of timber trees and timber. It is quite easy in many cases for one possessing no technical knowledge of the subject to read the story of these "wood destroying" fungi in the living tree. Branches broken by snow, by wind, or by falling timber provide entrance areas where the spores, lodging on the heart wood of broken timber, or on a bruise on the side of the trunk which has broken through the living part of the tree lying just beneath the bark, provide a point for entrance. The living substance (*protoplasm*) in the spawn exudes a "juice" (*enzyme*) which dissolves an opening in the wood cells and permits the spawn to enter the heart of the tree, where decay rapidly proceeds as a result. But very few of these plants can enter the tree when the living part underneath the bark is unbroken.

These observations suggest useful topics for thought. They suggest practical methods of prevention, careful forestry treatment and careful lumbering to protect the young growth when timber trees are felled. They suggest careful pruning of fruit and shade trees, by cutting limbs smooth and close to the trunk, and then painting the smooth surface with some lead paint.—Mushrooms, Edible, Poisonous, etc.

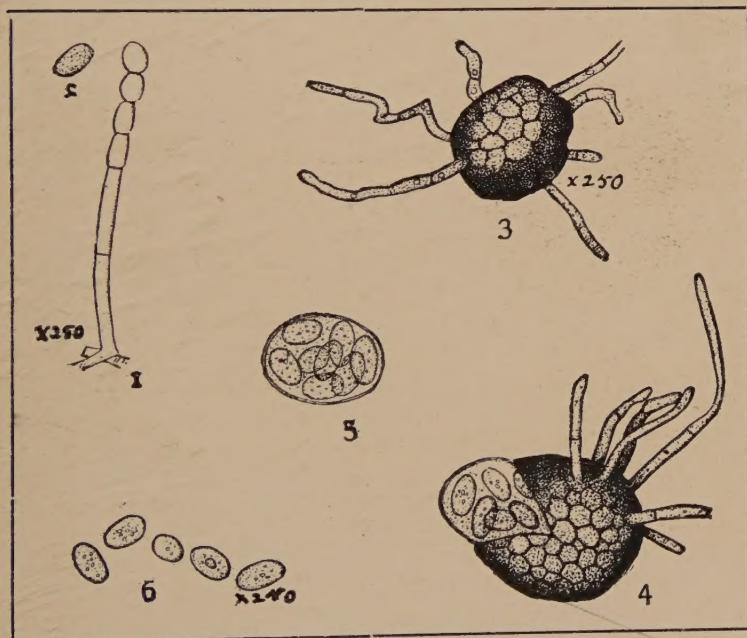


Fig. 192. MAGNIFIED figures of portions of the Leaf-mildew Fungus that causes (in conjunction with a mite) the Branch-knots or distortions on Hackberry trees, similar to Witches'-brooms, the latter shown in Figs. 193 and 194. Minute spores are shown at 1 and 2 which are produced early in the season, and later minute, scarcely visible, black spore-cases (shown at 3 and 4) are formed; these contain sacs (*asci*) of spores—eight in each sac or ascus (shown at 5); spores escaped from the ascus are shown (at 6). The botanical name of this microscopic fungus is *Sphaero-the'ca phy-topoph't-i-la*.



Fig. 193. BRANCH-KNOT OR WITCHES'-BROOM of the Hackberry tree, caused by a small mite and a microscopic fungus.

NOTES FROM MUSHROOM LITERATURE. II.

W. A. Kellerman.

THE VETERAN AMERICAN MYCOLOGIST, Professor Charles H. Peck, Albany, N. Y., describes several new species of Mushrooms, in the February No. of the *Bulletin of the Torrey Botanical Club* (1905). They are as follows:

Lepiota maculans Peck; found in September at St. Louis, by Dr. N. M. Glatfelter. Prof. Peck adds: This is a small but pretty species, easily known by the flesh of both pileus and stem changing to a reddish color where wounded and by the lamellae assuming a reddish or pink color with age or in drying.

Mycena denticulata Peck; St. Louis, August, Dr. Glatfelter. Pileus 12-20 mm. broad; stem 5-7 cm. long, 1-2 mm. thick.

Pleurotus umboatus Peck, on the ground, Kittanning, Pa., D. R. Sunstir e.

Lactarius sumstinei Peck; grassy places in open woods, Kittanning, Pa., Prof. Peck says this is related to such species as *Lactarius fuliginosus*, *L. gerardi* and *L. lignyotus*; but it may be separated from the first by its unchangeable milk and its more distant lamellae, and from the others by its acrid taste.

Marasmius sutliffae Peck; collected on lawn in shady places, Sacramento, California, by Miss M. L. Sutliff, who says that in a test of its edible qualities, she found that cooking seemed to intensify its bitter flavor and make it rival that of quinine.

Panus meruliiceps Peck; on trunks of elm trees, collected by Dr. Glatfelter, St. Louis, Mo.

Flammula multifolia Peck; on decaying wood in ravines. Dr. N. M. Glatfelter, St. Louis, Mo.

Cortinarius braendlei Peck; among fallen leaves in woods, Washington, D. C., collected by F. J. Braendle.

Cortinarius morrissii Peck; moist shaded places under hemlock trees, at Ellis, Mass., August to October; collected by G. E. Morris.

Stropharia schradieri Peck; in sandy, grassy soil about stumps, Washington, D. C.; collected by F. F. Schrader.

Psathyra multipedata Peck; densely cespitose, forming tufts of many individuals, in grassy ground, St. Louis, Mo., N. M. Glatfelter.

Geopyxis nebulosoides Peck; on decorticated wood, Canada, J. Macoun.

THE NORTH AMERICAN SPECIES OF MARASMIUS.—Prof. A. P. Morgan has printed in the *Journal of Mycology* a monograph of this genus which students find very useful. The author is one of our leading mycologists and he has for some time devoted much attention to the species of *Marasmius*. He enumerates 162 forms and also adds 6 species of *Heliomyces*. The latter are tremelloid when fresh and growing, but dry they have the appearance of species of *Marasmius*. No doubt (Prof. Morgan says) some tropical species of *Mycena* and *Marasmius* described from the dried specimens belong properly in *Heliomyces*. The species of *Marasmius* are grouped under several sections, and under these divisions are made in a syroptical manner, so that the student who undertakes the study of this interesting group has his labors lightened by the reason of the descriptive head-lines. The monograph can be obtained in pamphlet form as a reprint from the *Journal of Mycology*.

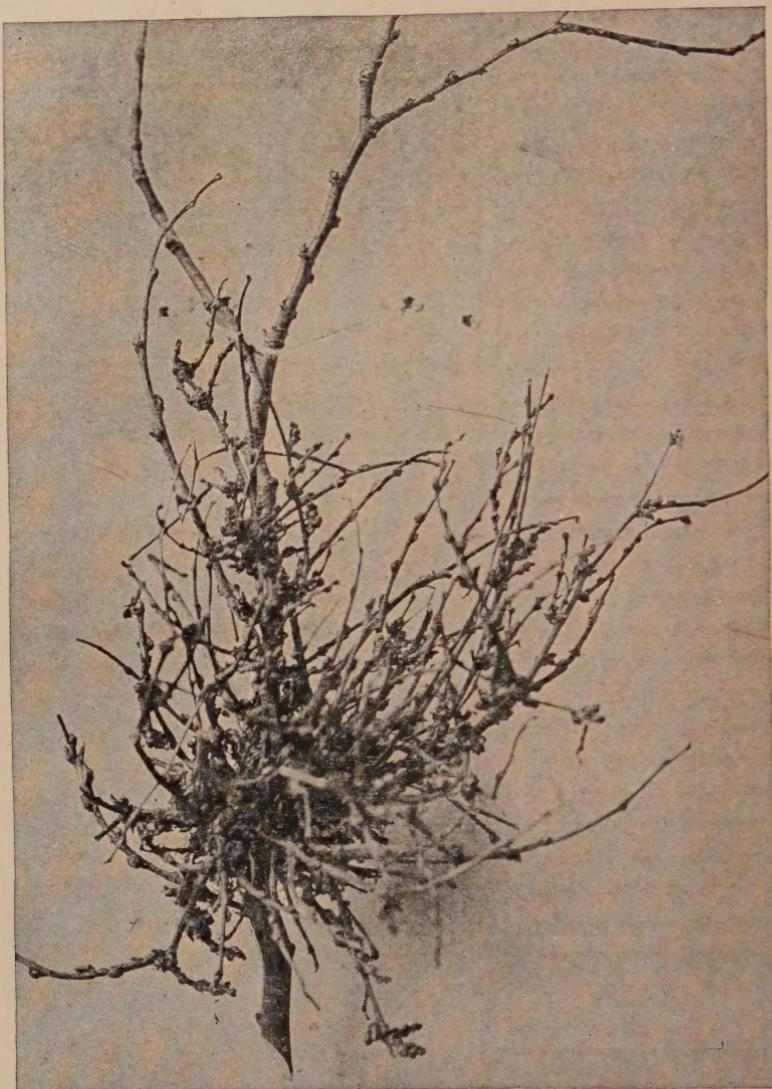
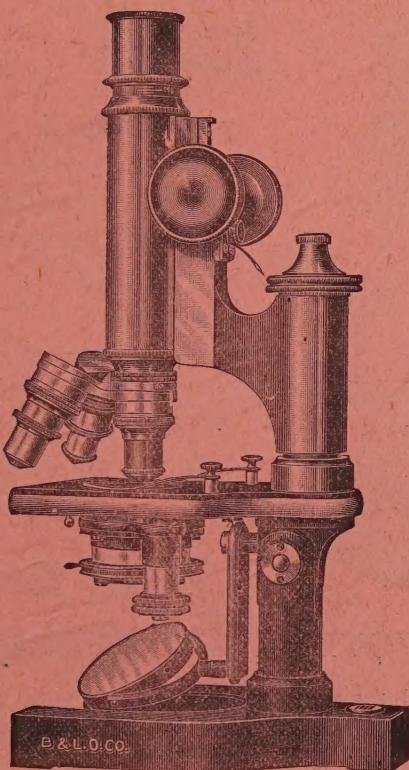


Fig. 194. BRANCH-KNOT OR WITCHES'-BROOM of the Hackberry tree—similar to that shown in Fig. 193, but photographed in the winter when the tree was destitute of leaves. See explanation in the text, also under Fig. 192, where the fungus is illustrated.

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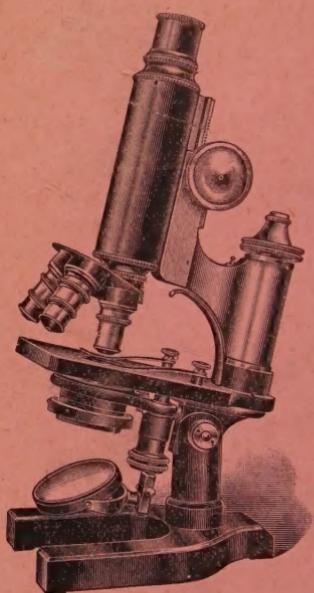
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